Please cancel claims 140, 148-160, and 169-178 without prejudice.

Please amend claims 188-190 to read as follows:

1-88. (Canceled)

89. (Previously Presented) A composition comprising:

a) a vector delivery structure comprising:

1) a cochleate comprising a lipid bilayer element and cations;

2) one or more proteins that facilitate the integration of one or more nucleotide sequences, that express a molecule, into the genome of a host cell; and

3) a polynucleotide comprising one or more DNA sequences recognized and bound by the one or more proteins and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences; and

b) a pharmaceutically acceptable carrier.

90. (Previously Presented) The composition of claim 89, wherein the polynucleotide is selected from the group consisting of a plasmid or nucleic acid construct.

91. (Previously Presented) The composition of claim 89, wherein the vector delivery structure comprises a polynucleotide that expresses one or more proteins that facilitate integration.

92. (Previously Presented) The composition of claim 89, wherein the cations are divalent cations.

93. (Previously Presented) The composition of claim 89, wherein the cations are calcium.

94. (Previously Presented) The composition of claim 89, wherein the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the

genome of a host cell are one or more binding proteins that have a DNA binding motif.

95. (Previously Presented) The composition of claim 94, wherein the one or more binding proteins are from adeno-associated virus type II.

96. (Previously Presented) The composition of claim 94, wherein the one or more binding proteins are at least one adeno-associated virus protein selected from the group consisting of Rep 68 and Rep 78.

97. (Previously Presented) The composition of claim 94, wherein the one or more binding proteins comprise Rep 68 and Rep 78.

98. (Previously Presented) The composition of claim 89, 96 or 97, wherein the one or more DNA sequences recognized and bound by the one or more proteins are the inverted terminal repeat regions of adeno-associated virus.

99. (Previously Presented) The composition of claim 98, wherein the one or more oligonucleotides or polynucleotides comprise a length of DNA that is flanked at each end by at least one of the inverted terminal repeat regions.

100. (Previously Presented) The composition of claim 94, wherein at least one of the one or more binding proteins is an integrase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said integrase.

101. (Withdrawn) The composition of claim 100, wherein at least one of the one or more binding proteins is an integrase that is not Rep 68 or Rep 78.

102. (Withdrawn) The composition of claim 94, wherein at least one of the one or more binding proteins is a helicase and at least one of the one or more sequences recognized and bound by the one or more DNA binding proteins is a substrate for said helicase.

103. (Withdrawn) The composition of claim 94, wherein at least one of the one or more binding proteins is a DNA excision enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA excision enzyme.

104. (Withdrawn) The composition of claim 94, wherein at least one of the one or more binding proteins is an isomerase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said isomerase.

105. (Withdrawn) The composition of claim 94, wherein at least one of the one or more binding proteins is a telomerase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said telomerase.

106. (Withdrawn) The composition of claim 94, wherein at least one of the one or more binding proteins is a DNA repair enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA repair enzyme.

107. (Withdrawn) The composition of claim 89, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of a host cell is a protein that has gene regulatory activity and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said protein that has gene regulatory activity.

108. (Withdrawn) The composition of claim 89, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of a host cell is a protein that facilitates transport to or uptake by the nucleus of the host cell.

109. (Previously Presented) The composition of claim 89, wherein the host cell is a

human cell.

110. (Previously Presented) The composition of claim 89, wherein the host cell is a pluripotent stem cell.

111. (Previously Presented) A composition comprising:

a) a vector delivery structure for delivering to the interior of a host cell one or more therapeutic nucleotide sequences, that express a molecule, and one or more proteins that bind to DNA for facilitating the integration of the one or more nucleotide sequences into the genome of the host cell, the vector delivery structure comprising:

1) a cochleate comprising a lipid bilayer element wherein the layers of the lipid bilayer element are bound together by a divalent calcium cation;

2) a DNA binding protein of adeno-associated virus type II comprising a Rep 68 protein and a Rep 78 protein; and

3) a polynucleotide comprising one or more inverted terminal repeat regions of adeno-associated virus type II and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequence; and

b) a pharmaceutically acceptable carrier.

112. (Previously Presented) The composition of claim 111, wherein the polynucleotide is selected from the group consisting of a plasmid or nucleic acid construct.

113. (Previously Presented) The composition of claim 111, wherein the one or more oligonucleotides or polynucleotides comprise a length of DNA that is flanked at each end by at least one inverted terminal repeat region.

114. (Previously Presented) The composition of claim 111, 112 or 113, wherein the vector delivery structure comprises a polynucleotide that expresses one or more proteins that facilitate integration.

115. (Previously Presented) The composition of claim 111, wherein the host cell is a human cell.

116. (Previously Presented) The composition of claim 111, wherein the host cell is a pluripotent stem cell.

117. (Previously Presented) A method for transforming a host cell in vitro with one or more nucleotide sequences, that express a molecule, the method comprising transfecting a host cell in vitro with a vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element and cations;

b) one or more proteins that facilitate the integration of said one or more nucleotide sequences into the genome of said host cell; and

c) a polynucleotide comprising one or more DNA sequences recognized and bound by the one or more proteins and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences.

118. (Previously Presented) The method of claim 117, wherein the polynucleotide is selected from the group consisting of a plasmid or nucleic acid construct.

119. (Previously Presented) The method of Claim 117, wherein the vector delivery structure comprises a polynucleotide that expresses one or more proteins that facilitate integration.

120. (Previously Presented) The method of claim 117, wherein the cations are divalent cations.

121. (Previously Presented) The method of claim 117, wherein the cations are calcium.

122. (Previously Presented) The method of claim 117, wherein the one or more proteins that facilitate the integration of one or more nucleotide sequences into the genome of a host cell are one or more binding proteins that have a DNA binding motif.

123. (Previously Presented) The method of claim 122, wherein the one or more binding proteins are from adeno-associated virus type II.

124. (Previously Presented) The method of claim 122, wherein the one or more binding proteins are at least one adeno-associated virus protein selected from the group consisting of Rep 68 and Rep 78.

125. (Previously Presented) The method of claim 122, wherein the one or more binding proteins comprise both Rep 68 and Rep 78.

126. (Previously Presented) The method of claim 117, 124 or 125, wherein the one or more DNA sequences recognized and bound by the one or more binding proteins are the inverted terminal repeat regions of adeno-associated virus.

127. (Previously Presented) The method of claim 126, wherein the one or more oligonucleotides or polynucleotides comprise a length of DNA that is flanked at each end by at least one of the inverted terminal repeat regions.

128. (Previously Presented) The method of claim 122, wherein at least one of the one or more binding proteins is an integrase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said integrase.

129. (Withdrawn) The method of claim 128, wherein at least one of the one or more binding proteins is an integrase that is not Rep 68 or Rep 78.

130. (Withdrawn) The method of claim 122, wherein at least one of the one or more binding proteins is a helicase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said helicase.

131. (Withdrawn) The method of claim 122, wherein at least one of the one or more

binding proteins is a DNA excision enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA excision enzyme.

132. (Withdrawn) The method of claim 122, wherein at least one of the one or more binding proteins is an isomerase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said isomerase.

133. (Withdrawn) The method of claim 122, wherein at least one of the one or more binding proteins is a telomerase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said telomerase.

134. (Withdrawn) The method of claim 122, wherein at least one of the one or more binding proteins is a DNA repair enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA repair enzyme.

135. (Withdrawn) The method of claim 117, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of the host cell is a protein that has gene regulatory activity and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said protein that has gene regulatory activity.

136. (Withdrawn) The method of claim 117, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of the host cell is a protein that facilitates transport to or uptake by the nucleus of the host cell.

137. (Previously Presented) The method of claim 117, wherein the host cell is a human cell.

138. (Previously Presented) The method of claim 117, wherein the host cell is a pluripotent stem cell.

139. (Previously Presented) The method of claim 117 or 138, performed in the absence of cytokine stimulation.

140. (Canceled)

141. (Previously Presented) A method for transforming a host cell in vitro with one or more nucleotide sequences, that express a molecule, the method comprising transfecting said host cell in vitro with a vector delivery structure for delivering to the interior of the host cell said one or more nucleotide sequences and one or more binding proteins for facilitating the integration of the one or more nucleotide sequences into the genome of the host cell, the vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element, wherein the layers of the lipid bilayer element are bound together by a divalent calcium cation;

b) a DNA binding protein of adeno-associated virus type II comprising a Rep 68 protein or a Rep 78 protein; and

c) a polynucleotide comprising one or more inverted terminal repeat regions of the adeno-associated virus and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences.

142. (Previously Presented) The method of claim 141, wherein the polynucleotide is selected from the group consisting of a plasmid or nucleic acid construct.

143. (Previously Presented) The method of claim 141, wherein the one or more oligonucleotides or polynucleotides comprise a length of DNA that is flanked at each end by at least one of the inverted terminal repeat regions.

144. (Previously Presented) The method of claim 141, 142 or 143, wherein the vector delivery structure comprises a polynucleotide that expresses one or more

proteins that facilitates integration.

145. (Previously Presented) The method of claim 141, wherein the target cell is a human cell.

146. (Previously Presented) The method of claim 141, wherein the target cell is a pluripotent stem cell.

147. (Previously Presented) The method of claim 141 or 146, performed in the absence of cytokine stimulation.

148-160. (Canceled)

161. (Withdrawn) The method of claim 160, wherein at least one of the one or more binding proteins is an integrase that is not Rep 68 or Rep 78.

162. (Withdrawn) The method of claim 154, wherein at least one of the one or more binding proteins is a helicase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said helicase.

163. (Withdrawn) The method of claim 154, wherein at least one of the one or more binding proteins is a DNA excision enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA excision enzyme.

164. (Withdrawn) The method of claim 154, wherein at least one of the one or more binding proteins is an isomerase and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said isomerase.

165. (Withdrawn) The method of claim 154, wherein at least one of the one or more binding proteins is a telomerase and at least one of the one or more DNA sequences

recognized and bound by the one or more binding proteins is a substrate for said telomerase.

166. (Withdrawn) The method of claim 154, wherein at least one of the one or more binding proteins is a DNA repair enzyme and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said DNA repair enzyme.

167. (Withdrawn) The method of claim 149, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of the host cell is a protein that has gene regulatory activity and at least one of the one or more DNA sequences recognized and bound by the one or more binding proteins is a substrate for said protein that has gene regulatory activity.

168. (Withdrawn) The method of claim 149, wherein at least one of the one or more proteins that facilitate the integration of the one or more nucleotide sequences into the genome of the host cell is a protein that facilitates transport to or uptake by the nucleus of the host cell.

169-178. (Canceled)

179. (Previously Presented) A vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element and cations;

b) one or more proteins that facilitate the integration of one or more nucleotide sequences, that express a molecule, into the genome of a host cell; and

c) a polynucleotide comprising one or more DNA sequences recognized and bound by the one or more proteins and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can treat defective genetic material in the genome of said host cell and are selected from the group consisting of a normal beta globin gene, a normal gene for adenosine deaminase, a normal

p47 phox gene, a normal p67 phox gene, and a gene encoding antisense RNA against a transforming oncogene contributing to leukemia or lymphoma.

180. (Previously Presented) A vector delivery structure for delivering to the interior of a host cell one or more nucleotide sequences, that express a molecule, and one or more proteins that bind to DNA for the integration of the one or more nucleotide sequences into the genome of the host cell, the vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element wherein the layers of the lipid bilayer element are bound together by a divalent calcium cation;

b) a DNA binding protein of adeno-associated virus type II comprising a Rep 68 protein or a Rep 78 protein; and

c) a polynucleotide comprising one or more inverted terminal repeat regions of adeno-associated virus type II and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can treat defective genetic material in the genome of said host cell and are selected from the group consisting of a normal beta globin gene, a normal gene for adenosine deaminase, a normal p47 phox gene, a normal p67 phox gene, and a gene encoding antisense RNA against a transforming oncogene contributing to leukemia or lymphoma.

181. (Previously Presented) The composition of claims 89 or 111, wherein said one or more nucleotide sequences that express a molecule can treat defective genetic material in the genome of said host cell and are selected from the group consisting of a normal beta globin gene, a normal gene for adenosine deaminase, a normal p47 phox gene, a normal p67 phox gene, and a gene encoding antisense RNA against a transforming oncogene contributing to leukemia or lymphoma.

182. (Previously Presented) A vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element and cations;

b) one or more proteins that facilitate the integration of one or more nucleotide sequences, that express a molecule, into the genome of a host cell; and

c) a polynucleotide comprising one or more DNA sequences recognized and bound by the one or more proteins and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can replace, correct, or modulate functions in metabolic pathways in said host cell and are selected from the group consisting of a normal gene for Cl complement protein inhibitor, a normal gene for a clotting factor, and a normal gene for insulin.

183. (Previously Presented) A vector delivery structure for delivering to the interior of a host cell one or more nucleotide sequences, that express a molecule, and one or more proteins that bind to DNA for the integration of the one or more nucleotide sequences into the genome of the host cell, the vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element wherein the layers of the lipid bilayer element are bound together by a divalent calcium cation;

b) a DNA binding protein of adeno-associated virus type II comprising a Rep 68 protein or a Rep 78 protein; and

c) a polynucleotide comprising one or more inverted terminal repeat regions of adeno-associated virus type II and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can replace, correct, or modulate functions in metabolic pathways in said host cell and are selected from the group consisting of a normal gene for Cl complement protein inhibitor, a normal gene for a clotting factor, and a normal gene for insulin.

184. (Previously Presented) The composition of claims 89 or 111, wherein said one or more nucleotide sequences that express a molecule can replace, correct, or modulate functions in metabolic pathways in said host cell and are selected from the group consisting of a normal gene for Cl complement protein inhibitor, a normal gene for a clotting factor, and a normal gene for insulin.

185. (Previously Presented) A vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element and cations;

b) one or more proteins that facilitate the integration of one or more nucleotide sequences, that express a molecule, into the genome of a host cell; and

c) a polynucleotide comprising one or more DNA sequences recognized and bound by the one or more proteins and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can treat cancer in said host cell and are selected from the group consisting of p53, rb (retinoblastoma gene product), ras, myc, fas ligand, and surface receptors.

186. (Previously Presented) A vector delivery structure for delivering to the ulterior of a host cell one or more nucleotide sequences, that express a molecule, and one or more proteins that bind to DNA for the integration of the one or more nucleotide sequences into the genome of the host cell, the vector delivery structure comprising:

a) a cochleate comprising a lipid bilayer element wherein the layers of the lipid bilayer element are bound together by a divalent calcium cation;

b) a DNA binding protein of adeno-associated virus type II comprising a Rep 68 protein or a Rep 78 protein; and

c) a polynucleotide comprising one or more inverted terminal repeat regions of adeno-associated virus type II and one or more oligonucleotides or polynucleotides, each containing said one or more nucleotide sequences;

wherein said one or more nucleotide sequences that express a molecule can treat cancer in said host cell and are selected from the group consisting of p53, rb (retinoblastoma gene product), ras, myc, fas ligand, and surface receptors.

187. (Currently Amended) The composition of claims 89 or 111, wherein said one or more nucleotide sequences that express a molecule can treat cancer in said host cell and are selected from the group consisting of p53, retinoblastoma, ras, myc, fas ligand, and surface receptors.

188. (Currently Amended) The method of claims 117[[,]] or 141, ~~149 or 172,~~ wherein said one or more nucleotide sequences that express a molecule can treat defective genetic

material in the genome of said host cell and are selected from the group consisting of a normal beta globin gene, a normal gene for adenosine deaminase, a normal p47 phox gene, a normal p67 phox gene, and a gene encoding antisense RNA against a transforming oncogene contributing to leukemia or lymphoma.

189. (Currently Amended) The method of claims 117[[,]] or 141, ~~149 or 172,~~ wherein said one or more nucleotide sequences that express a molecule can replace, correct, or modulate functions in metabolic pathways in said host cell and are selected from the group consisting of a normal gene for C1 complement protein inhibitor, a normal gene for a clotting factor, and a normal gene for insulin.

190. (Currently Amended) The method of claims 117[[,]] or 141, ~~149 or 172,~~ wherein said one or more nucleotide sequences that express a molecule can treat cancer in said host cell and are selected from the group consisting of p53, rb (retinoblastoma gene product), ras, myc, fas ligand, and surface receptors.